

EASILY OPENED FLUID POUCH

Cross Reference to Related Applications

[0001] This application claims the benefit of US Provisional Patent application serial number 60/447,657 filed February 14, 2003.

Background of the Invention

[0002] Packages formed of flexible film are a common and convenient package for beverages and other fluid materials. They are lightweight, generally inexpensive and, if made with proper materials, equipment and processes, can be highly resistant to leaks, tears, ruptures and other failures. One endemic problem with these containers, however, is striking an optimum balance between durability and ease of opening or access. Some of these packages have valves attached, particularly in larger sizes. However, this adds to the expense, and valves that are economically acceptable are not always satisfactory in operation.

[0003] Another approach has been to provide straws or other tubes with the packages. The straws typically have tapered or chiseled points that the consumer can use to punch a hole in the side of the package. CAPRI SUN® fruit juice packs, distributed by Kraft Foods Inc. under license from Rudolph Wild GmbH & Co. KG, exemplify this type. Packages of this general type of construction, and processes for their production, are illustrated and described in US Patent 3,380,646 to Doyen et al, the disclosure of which is incorporated herein by reference.

[0004] Unfortunately, the films of these packages sometimes are stronger than the straws and more adroit than the consumers. The packages may have a weakened spot that is designed to be

pierced, but these are not always readily found or struck, particularly if the consumer attempts to pierce the package at an angle. Thus, the straws frequently slip off the package, repeatedly. Attempting to pierce the bag at an angle can also rip or tear the package. If consumers try to compensate by piercing the package at right angles to the surface, they may pierce both the front and back films of the package, producing leaks.

[0005] There have been many attempts to solve this problem. Sections of the package wall have been reinforced, as disclosed in US Patent 5,425,583 to Wild. But this does not entirely solve the problem of locating the spot to insert the straw, or solve the problem of piercing both sides of the bag. Fitments for straws, valves, caps and the like have been proposed, as in US Patent 5,188,261 to Butters, US Patent 6,000,848 to Massioui and US Patent 6,273,307 to Gross et al. But they are somewhat bulky, and add a significant amount to the cost of the package. Another proposal has been to add a V-shaped film (also referred to as a gusset) at the top of the package, between the front and back panels, forming a pocket with a groove that is pierced by the straw, as disclosed in US Patent 6,076,968 to Smith et al, US Patent 6,164,825 to Larkin et al and US Patent 6,270,255 to Kaufmann et al. This requires a somewhat larger pouch, however, and adds some cost. Thus, it would be desirable to have a simple, flexible package for beverages and other fluid materials that can be pierced with a straw or other tube with less difficulty.

Summary of the Invention

[0006] This invention provides containers for fluid materials, such as flexible pouches for beverages, with a piercable sealing element that is easier to locate and pierce. These containers have a fitment, sealed between edges of a front and a rear panel, with a tubular opening extending through the fitment and a frangible seal of a piercable barrier material, i.e. a material that substantially inhibits the transmission of gaseous and/or liquid material into and out of the pouch, covering the opening. With this construction, the spot to be pierced with the straw is well defined and, since the seal is held securely by the fitment, easier to pierce. In addition, the placement of the fitting minimizes the risks of puncturing both sides of the container.

[0007] Other advantages of this invention will be apparent from the following description.

Drawings

[0008] Figure 1 is a front elevation view of one container for fluid materials embodying this invention.

[0009] Figure 2 is a side elevation view of the container shown in Figure 1.

[0010] Figure 3 is a top plan view of the container shown in Figures 1 and 2.

[0011] Figure 4 is an enlarged fragmentary sectional view of the top seal, from the same vantage point as Figure 1.

[0012] Figure 5 is a perspective view of another container embodying this invention.

[0013] Figure 6 is a partially broken away side elevation view of the container shown in Figure 5.

[0014] Figure 7 is a sectional detailed view of components used for the packages in Figures 5 and 6.

[0015] Figure 8 is a similar detailed sectional view illustrating an alternate method of construction.

[0016] Figure 9 is a further enlarged cross-sectional view of a container made in accordance with Figure 8.

[0017] Figure 10 is an enlarged view of the fitment in the top seal of the container in Figure 5, with the front panel of the container removed to show detail of the fitment.

[0018] Figure 11 is an enlarged bottom view of the fitment in Figure 10, taken along lines 11-11 in Figure 10.

Detailed Description

[0019] Figures 1-4 illustrate a beverage container, referred to generally as **20**, embodying this invention. Container **20** comprises a pouch **21**, having a front panel **23** and a rear panel **25**, best seen in Figure 2. The side edges of the front panel **23** and rear panel **25** are welded together at a left side seam or seal **31** and a right side seam **33**. A top seam **35** extends from the left side seam **31**, around a fitment **120**, to the right side seam **33**. Readers should understand that, as used herein, terms such as "front," "rear," "side," "left," "right," "top" and "bottom" are arbitrary. They refer to the positions of the illustrated containers in the figures, are used for convenience of understanding, and should not be understood to indicate any position which these containers must assume in use.

[0020] The illustrated pouch **21** may be formed by folding a unitary sheet of material and welding side edges as shown in Figure 1. However, it may also be formed from two separate webs of material, with the bottom edges of the sheets welded together in the same manner as the side edges.

[0021] The fitment **120** and other elements forming the upper end of the container are illustrated in more detail in Figure 3 and Figure 4. Fitment **120** comprises a tubular conduit **121** which extends through top seal **35**. A weld flange **123** extends laterally from the upper end of tubular conduit **121**. An opening **125** extends through the weld flange **123** and tubular conduit **121**, providing access to the beverage or other fluid material inside the pouch. A top surface **127** of weld flange **123**, which is preferably substantially planar, is preferably covered by a pierceable barrier seal **131** which protects the material inside the pouch. Seal **131** should include a barrier material, such as aluminum foil or ethylene vinyl alcohol (EVOH), which protects the material inside the pouch but is readily pierced by the illustrated straw **141**, which has a chiseled or tapered tip **143**, or other implement, to access and consume or otherwise use the beverage or other fluid material within the pouch. Straw **141** may be attached to the exterior of the pouch, optionally encased in a protective sleeve, and adapted for detachment by the consumer or separately supplied. Seal **131** is preferably attached to the top surface **127** of weld flange **123**, for ease and economy of construction, but could also be attached to the bottom surface of the flange, or in some cases a seal could be applied to both surfaces.

[0022] Pouch **21** may be constructed of a wide variety of single-layer or multi-layered films. As seen in Figure 3,

three-layered films having an inner layer of polyethylene or other material that is acceptable for beverage service and can be sealed to itself by heat bonding is preferred. Barrier materials, such as aluminum foil, polymers such as PET, nylon, polypropylene, coated with silicon oxide (SiOx) or aluminum oxide (AlOx), or co-extruded with EVOH, are preferred for the center layers **232** and **252**. Transparent materials, such as polyester and nylon are preferred for the outer layers **233** and **253**, which are preferably printed on the inside of the outer layer to protect the printing. As seen in Figure 3, the inner layer **231** of front panel **23** and the inner layer **251** of rear panel **25** are bonded to each other and to the outer surface of tubular conduit **121** to seal the top of the container.

[0023] Figures 5 through 11 disclose another fluid container, generally referred to as **60**, embodying this invention. Container **60** has a standup pouch **61**, i.e., a pouch designed to stand erect on its own base or bottom. Like the pouch shown in the previous figures, pouch **61** is constructed from a front panel **63** and a rear panel **65**. However, pouch **61** also has a bottom panel **67** which enables the pouch to stand erect. As best seen on the cutaway right-hand side of Figure 6, the center of the bottom panel is substantially horizontal when the central portion of the pouch is filled with liquid and stands erect. However, as seen in Figure 5, the outer ends of bottom panel **67** extend upwardly to points **66** along the side edges and above the bottom or base of the pouch. The bottom panel **67** is also sealed to the front panel **63** and the rear panel **65** along a lateral or transverse seam **77**, at the bottom edges of the front and rear panels, and along diagonal or orthogonal seals **79** which extend from the aforementioned points **66** along

the side seams **71** and **73** to points **68**, along the transverse seams, displaced from the side seams.

[0024] Container **60** has either an elongated or boat-shaped fitment **160**, illustrated in Figures 10 and 11, or a non-elongated fitment (straight edge) in a top seam **75** between front and rear panels **63**, **67**. A tubular opening **161** through fitment **160** provides access to the pouch contents. A series of laterally extending ribs **167** or sealing surfaces provide narrow sealing surfaces that reduce the pressure needed to ensure a good seal between the fitment **160** and the front and rear panels of the pouch. Ribs **167** taper to laterally extending fins **168** which help to prevent leaks at the corners between the panels and the fitment.

[0025] A welding flange **173** extends laterally from the top of the fitment **160**. The flange is covered with a pierceable seal **171**, preferably of a barrier material containing aluminum foil or ethylene vinyl alcohol. Like the barrier seal **131** for pouch **20**, seal **171** provides a well defined, securely held seal that is easy to pierce with a straw or other implement to consume or otherwise use the beverage or other fluid material within the pouch.

[0026] The pouch illustrated in Figures 5-11, like the pouch illustrated in Figures 1-4, may be constructed of one, two, three or more layers of disparate film. Figure 7 illustrates one method for producing a pouch of this type. The front panel **63**, rear panel **65** and bottom panel **67** are produced from one or more webs of flexible material, with the bottom panel **67** being folded to form a narrow "U" or "V" shape that is placed between the front panel and rear panel. The side edges of the panels are heat sealed together to form the left and right side seams

71 and **73**. The inner surfaces **631** and **651** of the front and rear panels **63** and **65** are sealed to the inner surface **671** of the bottom panel **67**. The outer side **672** of the bottom panel is sealed to itself, thus providing unbroken side seams **71** and **73** from the top of the container to the bottom.

[0027] During the heat sealing of the panels, a non-adhesive shield is placed between the centerfolds of the bottom panels so that the outer sides **672** of the bottom panel **67** will not be welded together other than at the side seams **71** and **73**. Thus, the sides of the pouch are free to expand and assume the stable position shown in Figures 5 and 6.

[0028] Figures 8 and 9 illustrate an alternate method of producing the pouches shown in Figures 5 and 6 from a single web of a two layer material. The inner layer **871** is heat sealable, but the outer layer **872** may be a non-sealable barrier material or a material selected for other properties.

[0029] The outer layer **872** has holes **874** along its side edges in the section that is folded to form the bottom panel. Holes **874** are aligned for sealing, as shown in Figures 8 and 9, and the inner layers **871** of the bottom panel **87** are sealed to each other, through holes **874**, as well as to the inner layers **831** and **851** of the front and rear panels **83** and **85**. Thus, substantially continuous seams are formed along the side edges of the pouch, but the central section of the bottom panel is free to unfold. With this construction, the transverse seam may be omitted or may extend only part way across the width of the pouch. However, this seam may still be desirable for stability.

[0030] Of course, while the invention has been described in detail, with particular emphasis on preferred embodiments, those

skilled in the art should also appreciate that many variations and modifications to and variations of the embodiments described herein within the spirit and scope of this invention, which is defined by the following claims.